MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

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FINAL EXAMINATION

T1, 2018 / 2019

BOM7094 – OPERATIONS MANAGEMENT

(MBA Full Time)

26 SEPTEMBER 2018
9.00 a.m – 12.00 p.m
(3 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of **SEVEN (7)** pages including this cover page.
2. Answer **ALL** questions. All questions carry equal marks.
3. Please write your answers in the **Answer Booklet** provided
4. You are allowed to use non-programmable calculator.

Answer ALL questions. All questions carry equal marks. **(20 x 5 = 100 marks)**

Question 1

a. Why has the supply chain network perspective of operations management more important in recent years?

(10 marks)

b. Chinese phone component maker Holitech Technology Company will invest $200 m to set up a facility to manufacture five key components that go into a smartphone. The components will exclusively be manufactured for Xiaomi India. The facility would have the capacity to produce 50 million components in each of the five categories in the first phase. The second phase would double its capacity. The facility will manufacture Compact Camera Modules (CCM), Thin Film Transistors (TFT), Capacitive Touch Screen modules (CTP), Flexible Printed Circuits (FPC), and fingerprint sensors.

The phone maker has six (third-party) factories to produce phones and another for making power banks. The managing director said Holitech's facility would help reduce the import of components that go into a phone. "Our aim is to source the phone components locally. It may not reach 100 per cent, but it can get as close as it can get to 100 per cent," he said.

What is the operations strategy adopted by Holitech Technology Company to produce the components in India? What are the advantages of the same?

(10 marks)

Question 2

a. Read the case and answer the question below:

With a 17 per cent share in India's milk production, Uttar Pradesh is key for the development of the country's dairy sector. But the State, which produces around 7.55 crore litres of milk a day, has just been a blip on India's dairy map. State-owned Pradeshik Cooperative Dairy Federation, which sells milk and milk products under the Parag brand, has only a marginal presence.

Uttar Pradesh has largely remained the land of *dhudiyas* and the catchment for a few private dairy players. With hardly any quality control, adulteration was rampant. Things, however, took a turn for the better about three years ago when Banas Dairy — one of the biggest dairies in Asia in the cooperative sector — set up shop in the State. Banas Dairy is the largest member union of the Gujarat Cooperative Milk Marketing Federation (GCMMF), which sells milk under the Amul brand. It has two plants of 5 lakh capacity each in Kanpur and Lucknow catering to a sizeable number of small dairy farmers in many central UP districts.

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Improving livelihoods

"Since the time we have set up operations here, we have been able to give hundreds of small farmers a better livelihood option. More importantly, we have been able to bring down the practice of adulteration significantly," said Amrish Dwivedi, who heads the operations at the Kanpur plant, located at Mati, 55 km from Kanpur city. "Earlier, dairy farmers here used to mix salt or sugar so that they get better SNF (solids-not-fat portion) value of milk, which fetched them better prices. If nothing else, they would add water to jack up the quantity," he said.

According to Dwivedi, both the plants together collect 6.5 lakh litres of milk every day. "We have a total of nine milk chilling centres located in Kanpur and surrounding districts, including Kannauj, Divyapur, Etawah, Lucknow and Varanasi. There are about 1,300 cooperative milk societies whose membership ranged from a few tens to a couple of hundreds," he said.

The entry of Amul has been a boon for small dairy farmers, who keep a few cattle. They are not only getting better returns, but also getting timely payments. "Before Amul, farmers were at the mercy of private diaries which were paying them paltry sums, erratically," said Chandra Mohan Singh, the procurement in-charge for Kanpur Dehat district. "Milk production in these areas has been up in the last few years, thanks to Amul. Farmers have started looking at keeping cattle as a viable livelihood option," said Ghaneshyam Singh Badonia, a farmer in Dalelpur village, Kanpur district.

According to Dwivedi, Amul's entry has helped consumers, too. "People started realising what is quality milk. Even our competitors — private dairies — have no choice but to deliver quality milk. So, there has been a greater impact on society." But, there is a long way to go, he adds. "The demand for pouch milk is still low in UP, but is picking up."

i. How does Banas diary bring about quality milk to Utter Pradesh? What are their repercussions?

(10 marks)

b. Read the case and answer the question below:

US PRESIDENT Donald Trump may well be the best thing that's happened to Southeast Asia's humble electronics industry in quite a while.

Relatively small, and frankly not as sexy as their North Asia cousins, makers of components and devices with factories dotted around the region may get some time in the spotlight thanks to the U.S. administration's decision last month to levy an additional 25 percent import tax on 818 separate items from China. Assembly of name-brand gadgets like Apple Inc.'s iPhones tends to grab an outsized share of attention from media, analysts and investors.

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Yet crucial parts of the electronics supply chain that also rely on low-cost manufacturing exist in Southeast Asia, such as capacitors, printed circuit boards, hard drives and blue tooth headsets. Some investors have already taken notice of the fact that Thailand, Malaysia, the Philippines and Vietnam stand as likely beneficiaries of the U.S.-China trade war. With Trump repeatedly upping the ante, the U.S. president is likely to remain an accidental ally. – Bloomberg

What are the biggest challenges for US in managing supply networks?

(10 marks)

Question 3

a. The manager of an assembly line took ten samples each with ten observations, under ideal conditions to develop control limits for an X-bar and R-chart. The mean and range of each sample is shown below:

Sample	Mean	Range
1	4.80	0.42
2	4.50	0.51
3	4.70	0.52
4	4.90	0.19
5	5.00	0.35
6	5.10	0.41
7	4.30	0.34
8	4.80	0.41
9	4.75	0.49
10	5.05	0.38

i. What would be the 1, 2 & 3 std. deviation control limits for X-bar chart and R-chart? Draw a chart and mark the values. (A_2= 0.31, D_4=1.78 & D_3=0.22)

(5 marks)

ii. Comment on the data points in the control chart and the process control in both the charts.

(5 marks)

b. Three forecasting models were used to forecast demand for a product. The forecasts and the corresponding demand that subsequently occurred are shown below. USE MAD, MSE & MAPE to evaluate the accuracy of the forecasting model.

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Month	Actual demand	3 month SMA	ES α = 0.4	ES α = 0.7
1	42			
2	38		42.00	42.00
3	45		40.40	39.20
4	42	41.67	42.24	43.26
5	45	41.67	42.14	42.38
6	39	44.00	43.29	44.21
7	40	42.00	41.57	40.56
8	45	41.33	40.94	40.17
9	39	41.33	42.57	43.55
10	46	41.33	41.14	40.37
11	41	43.33	43.08	44.31

Question 4

a. As McDonald's seeks to modernize its business, the company is placing a big bet on mobile and other tech platforms. McDonald's has been systematically adding self-service ordering kiosks and table service to stores as it works to "build a better McDonald's." "What we're finding is when people dwell more, they select more," CEO Steve Easterbrook told CNBC on "Squawk on the Street" on Monday. "There's a little bit of an average check boost."

In fact, the company plans to upgrade 1,000 stores with this technology every quarter for the next eight to nine quarters. "If you think about only two years ago, if you were a customer there were two ways you can get served at McDonald's," Easterbrook said. "You walked to the front counter and line up and take your drink and find a table or you go through the drive through. We're introducing many options. They can order through mobile, they can come curbside and we'll run it out as well as the existing traditional ways. You can pay in different ways and customize your food in different ways. I think we're trying to add more choice and variety."

Compare McDonald's old and current process for making hamburgers. How valid is McDonald's claim that the new process will produce fresher hamburgers for the customers? Comparing the McDonald's new process to the process used by Burger King and Wendy's, which process would appear to produce the freshest hamburgers?

(10 marks)

Continued..

b. A company is able to obtain quantity discounts on its order of materials as follows:

Price per kg	Kg bought
6.00	Less than 250
5.90	250 and less than 800
5.80	800 and less than 2000
5.70	2000 and less than 4000
5.60	4000 and over

The annual demand for the material is 4000 kg. Holding costs are 20% per year of the material cost. The order cost is RM6. Calculate the best quantity to order.

(10 marks)

Question 5

a. No matter how successfully a company employs lean processes, pockets of idle inventory and barriers to flow can blend into the background of daily operations until someone points out the obvious. It's a prolific—albeit painful—moment for many lean companies. For heavy-equipment manufacturer Vermeer, one of these moments came during an annual meeting of its industrial dealers in 2005.

"Vermeer had been on the lean journey for many years, and at the end-of-the-year dealer meetings we would talk about how lean is benefitting us, and how we can now manufacture a brush chipper in a few days from raw materials to finished good," explains Chad Vander Wilt, manager of transportation and logistics at Vermeer. "And they sat and listened for several years, and then they said,*'You know, you talk about how you can manufacture that brush chipper in a few days, but it takes us anywhere from 90 to 120 days to get that chipper. So how is this helping the dealers and distribution network?'.*

"That was a great wake-up call to us that, yes, we can manufacture something quickly, but if we can't get it to our dealers and then the end customer faster, lean is only going to get us so far. That's when the light bulb went off." The light bulb became a program to plan the best way to replace batch ordering in the domestic industrial-line distribution network with replenishment. During the next two years, the Pella, Iowa-based company's 20-plus domestic dealers would become heavily involved in the replenishment planning and, in some cases, further their own lean transformations because of it.

Today, the *program* has become a *process* that automatically triggers an order for a new piece of equipment from Vermeer's top-selling industrial line each time a dealer closes a sale at his store.

Discuss the lean concept used in this case to manufacture a brush chipper in a few days from raw materials to finished good.

(10 marks)

Continued..

b. A company makes a product with a product code S40. Each S40 consists of two subassemblies A10 and B5. Subassembly A10 consists of part 1765 (two required) and part 1867 (one required). Part 1867 is in turn made from part 8644 (one required) and part 2888 (five required). Subassembly B5 consists of part 2887 (two required) and part 2888 (four required).

i. Draw a tree diagram showing the product structure of product S40.

(5 marks)

ii. Show an indented bill of materials for product S40.

(5 marks)

End of Paper